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# Sensor-supported high resolution profiling of the excess partial pressure of carbon dioxide in low order fluvial systems.

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The excess partial pressure of carbon dioxide in a surface freshwater is a dynamic representation of the interacting biogeochemical processes that consume and produce carbon dioxide. As efflux of the excess gas represents direct linkage of the terrestrial with the atmospheric C cycle, describing this interaction is important as it allows us to identify controls on the process. Here we present an almost complete time series of excess partial pressure of carbon dioxide in a small order river system close to the terrestrial-aquatic interface for the hydrological years 2003-2008. This record would not be possible without the use of continuously logged measurement of stage height to estimate the concentration of the fluvial dissolved inorganic C (DIC) pool and pH, temperature and atmospheric pressure to speciate the DIC pool and calculate atmospheric equilibrium concentrations.
Here we will explain how this time series was generated, and from the five year time series, consider some of the detail that high resolution sensor-generated profiles reveals e.g. a consistent drop in excess partial pressure of carbon dioxide prior to the commencement of rising stage height; diurnal variation excess partial pressure of carbon dioxide although temperatures are low; the response of excess partial pressure of carbon dioxide to event flow.